

REMARKS

In the Office Action, claims 1-5, 9-11, 14, and 15 stand rejected under 35 U.S.C. § 102(b) as anticipated by United States Patent No. 6,769,844 issued to Waggle ("Waggle"), and claims 6-8 and 12 stand rejected under 35 U.S.C. § 103(a) as unpatentable also over Waggle. Applicants have added new claims 16-27.

§§ 102(b) and 103(a) Rejections

Applicants respectfully submit that a claim rejection based on anticipation under § 102(b) requires that a single prior art reference disclose each and every element of the claimed invention. See MPEP § 2131 (stating that a claim is anticipated only if each and every element as set forth in the claim is disclosed in a single prior art reference). Waggle discloses a cutting insert having a convex wiper cutting edge defined between two wherein one of the surfaces is a clearance face having a positive clearance angle. See *Waggle*, column 1, lines 7-11. The cutting insert of Waggle has substantially flat clearance faces. See *Waggle*, column 2, line 67 to column 3, line 1; column 3, lines 4-8; column 4, lines 1 to 2; column 4, lines 1 to 2; column 4, lines 10 to 13; column 4, lines 60 to 63; column 5, lines 4 to 5; column 5, lines 42 to 45; column 5, lines 55 to 56; column 6, lines 12 to 13; column 6, lines 21 to 22; column 7, lines 3-6, for example. Therefore, the disclosure of Waggle does not anticipate, suggest, or motivate one skilled in the art to produce the cutting insert of claim 1, or claims 2-12, 14, and 15 dependent from claim 1, as presently presented. A cutting insert of claim 1 comprises, among other things, at least one conical clearance surface adjacent to at least one of the convex cutting edges.

The cutting insert's convex geometry of Waggle is oriented in the direction that is perpendicular to the bottom surface of the cutting insert, or in other words, the cutting edge is convex upwards. See *Waggle*, all figures in *Waggle*,

specifically, Figure 9 indicating R_{maj} , Figure 10 indicating R_{min} , and Figure 18 indicating R . The convex cutting edges are defined by the convex portion of the rake face and the substantially flat clearance face. The cutting insert of the new claims 16-27 comprise at least four cutting edges, wherein at least a portion of at least one cutting edge is in the shape of an arc or a portion of an ellipse and the cutting edges are substantially parallel to the bottom surface. This is not disclosed, nor obvious, from the disclosure of Waggle that disclosed a convex portion perpendicular to the bottom face.

The convex cutting edge having the wiper geometry of Waggle may have advantages in producing an improved surface finish. However, the perpendicular convex cutting edge will not contribute to the machining capability for high feed machining. Such an upward convex wiper cutting edge may be used for improving surface finish but is not commercially suitable for applying high feed rate in a rough machining operation. Both theory and practice have proved that such geometry is not suitable for high feed machining involving very rough cutting conditions. Embodiments of the cutting inserts of the present invention combine the advantages of round-shaped cutting inserts having a very large radius, and square-shaped inserts of conventional size adapted for conventional use in a variety of high speed and rough machining applications.

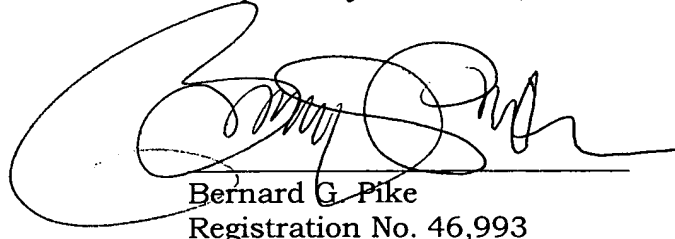
As a further comparison from the geometry point of view, Waggle provides cutting inserts with perpendicular (or upward) convex cutting edge and, therefore, cannot provide cutting inserts, as most widely used, with substantially flat, parallel cutting edges. The cutting inserts of Waggle are apparently intended for machining improved surface finish in finishing machining operations with relatively light cutting conditions. The upward convex cutting edge would not be commercially suitable for high productive machining with strong high feed machining capability for

roughing machining operations. A cutting insert having a convex cutting edge substantially parallel to the bottom surface allows a greater length of engagement for the cutting edge than a similar conventional cutting insert with a linear cutting edge for the same depth of cut. This reduces the stress per unit length of the cutting edge and may, in turn, enable the use of relatively high feed rates or longer insert life in comparison with conventional cutting inserts employed in face milling operations.

CONCLUSION

Applicants believe that they have fully addressed each basis for rejection under § 102(b) and § 103(a). Reconsideration of the claims of the subject application and issuance of a Notice of Allowability is respectfully requested. Should the Examiner have any remaining concerns, he is requested to contact the undersigned at the telephone number below so that those concerns may be addressed without the necessity for issuing an additional Office Action.

Respectfully submitted,



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